

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Czayka, et al

Examiner: T. Yoon

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Art Unit: 1714

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For: RADIATION THICKENED SHEET MOLDING COMPOUNDS

**PRE-APPEAL BRIEF REQUEST FOR REVIEW AND
STATEMENT ACCOMPANYING REQUEST FOR PRE-APPEAL BRIEF REVIEW**

A pre-appeal brief request for review is hereby made. The Applicants maintain that the Examiner has not established *prima facie* cases of anticipation or obviousness of pending claims. Claims 19-26 stand rejected as being unpatentable over U.S. Patent 4,327,145 to Mitani et al. (“Mitani”) under 35 U.S.C. §102(b) and 35 U.S.C. §103(a). Additionally, claims 19-26 stand rejected as being unpatentable over U.S. Patent 3,429,950 to Parker, Jr. (“Parker I”) under 35 U.S.C. §102(b) and 35 U.S.C. §103(a). Claims 19-26 also stands rejected under 35 U.S.C. §103(a) as unpatentable over Parker I in view of U.S. Patent 3,300,544 to Parker, Jr. (“Parker II”), Japanese Patent JP54120675A, or Japanese Patent JP401251791A. Claims 2-4, 10-14, and 19-30 stand rejected under 35 U.S.C. §103(a) as unpatentable over Mitani or Parker I in view of U.S. Patent 6,063,864 to Mathur et al. (“Mathur”), U.S. Patent 5,985,785 to Lane et al. (“Lane”), or Japanese Patent JP54120675A.

The Examiner maintains that the recitation of “consisting essentially of” in claims 19-26 does not overcome the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) based on Mitani. The Examiner references *In re De Lajarte* (337 F.2d 870, 143 USPQ 256 (C.C.P.A. 1964)) and maintains that the Applicants bear the burden of showing that the introduction of additional components would materially change the properties of the composition. The Examiner further alleges that the Applicants have not shown any novel characteristics of such a composition. However, the Court in *De Lajarte* also states that a lack of elements is a key factor in determining that a prior reference does not anticipate an Applicant’s claims. (337 F.2d at 875,

143 USPQ at 259). As stated previously, the specification provides clear advantages of molding compounds without thickening agents such as metal oxides. The presence of such agents can lead to high variability of product, the introduction of undesired moisture and resulting creation of unwanted chemical reactions during molding, and the possibility of a non-isotropic molded material due to flow of the molding compound. Contrary to the Examiner's assertion, these drawbacks in prior compositions are fully provided on pages 1 and 2 of the specification and would have been recognized by a person having ordinary skill in the art.

The use of "consisting essentially of" language only allows the presence of additional components that do not materially effect the properties of the resulting composition. In attempting to apply *De Lajarte* to this rejection, the Examiner ignores that *De Lajarte* also states that one cannot assume that small differences are incapable of causing a difference in properties. *De Lajarte* does not shift the Examiner's burden of establishing a *prima facie* case of anticipation or obviousness to Applicants in the instance of "consisting essentially of" claims. In any event, the Applicants have fully provided an explanation of the advantages provided by the claimed invention, as detailed above.

Additionally, as stated previously, one of ordinary skill in the art would recognize that the inclusion of other thermoplastic components would *de facto* alter the properties of the final product or performance of the method. For example, the inclusion of isocyanates, as in Mitani, carries with it certain hazards. As indicated by the U.S. Department of Labor, Occupational Safety and Health Administration publication, attached as Appendix A, one of ordinary skill in the art would recognize that isocyanates are irritants to the skin and mucous membranes and include compounds which are suspected human carcinogens. On this basis alone, the use of isocyanates as taught by Mitani is undesirable and is contrary to the claimed methods and compositions. Additionally, one of ordinary skill in the art would also recognize that the addition of isocyanates into a composition as otherwise claimed would have distinct physical properties compared to a similar composition that was devoid of isocyanates. Furthermore, the omission of additional components such as isocyanates provides for a simplified preparation of sheet molding compounds.

Therefore, Mitani can not be said to teach or suggest a molding compound consisting essentially of at least one unsaturated oligomer resin, at least one unsaturated monomer, and

optionally at least one free radical initiator. The omission of compounds present in Mitani, as in claims 19-26, provides a composition with basic characteristics that are novel and non-obvious over Mitani. Reversal of the Examiner's rejection of claims 19-26 under 35 U.S.C. §102(b) as anticipated by or under 35 U.S.C. §103(a) as obvious over Mitani is requested.

Claims 19-26 stand rejected under 35 U.S.C. § 102(b), as anticipated by, or in the alternative under 35 U.S.C. § 103(a), as obvious over Parker I. The Examiner references *In re De Lajarte* and maintains that the Applicants bear the burden of showing that the introduction of additional components would materially change the properties of the composition. The Examiner further alleges that the Applicants have not shown any novel characteristics of such a composition. However, as discussed above, the Court in *De Lajarte* also states that the lack of elements was a key factor in determining that the prior reference did not anticipate the Applicant's claims. *Id* at 875. Parker I provides a B-stage polyester through the use of a precise amount of "a specific class of quinone modifiers," dialkyl p-benzoquinones (column 2, lines 38-46). Claims 19-26 do not permit the presence of additional components in the molding composition that materially effect the claimed composition, including such "quinone modifiers." Therefore, claims 19 – 26 recite a simplified and novel composition over that disclosed by Parker I and are not anticipated by Parker I.

Claims 19-26 are also non-obvious in view of Parker I. Under *Graham v. John Deere Co.*, an obviousness determination under 35 U.S.C. 103 requires analysis of 4 factors:

- (A) Determining the scope and contents of the prior art;
- (B) Ascertaining the differences between the prior art and the claims in issue;
- (C) Resolving the level of ordinary skill in the pertinent art; and
- (D) Evaluating evidence of secondary considerations.

Additionally, when applying 35 U.S.C. 103, the following tenets of patent law must be adhered to:

- (A) The claimed invention must be considered as a whole;

- (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
- (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and
- (D) Reasonable expectation of success is the standard with which obviousness is determined.

(MPEP § 2141, quoting *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).)

Parker I provides no suggestion that the omission of such “quinone modifiers” is possible. To the contrary, Parker I indicates that it is the presence of specific modifiers in a precise quantity that makes it possible to create a B-staged polyester/monomer product (Abstract). The claimed invention provides a stable B-staged molding composition without the use of “modifiers” such as dialkyl p-benzoquinones. Therefore, Parker I actually teaches away from the claimed invention. Additionally, the lapse of 33 years between the issuance of Parker I and the earliest priority date of the present application further demonstrates that the claimed invention is not obvious in view of Parker I, particularly in view of the known drawbacks to the use of thickening agents discussed above. As with the previously discussed rejection, the Examiner maintains, “the recitation of ‘consisting essentially of’ alone cannot overcome the rejection based on art reciting ‘comprising,’” and cites *De Lajarte* for support for this contention. As also mentioned above, *De Lajarte* does not shift the burden of establishing a *prima facie* case from the Examiner. Reversal of the rejections of claims 19-26 under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) as anticipated or obvious over Parker I is respectfully requested.

The Examiner also rejected claims 19-26 under 35 U.S.C. § 103(a), as obvious over Parker I in view of Parker II or JP54120675 or JP 401251791. However, none of the cited references teach or suggest a molding compound consisting essentially of at least one unsaturated oligomer resin, at least one unsaturated monomer and optionally, at least one free radical initiator. While Parker I provides the use of dialkyl p-benzoquinones to produce a b-

staged polyester, Parker II provides a different quinone, 1,4-naphthoquinone, as a “polymerization modifier” for that purpose.

Neither Parker I nor Parker II provides any suggestion that the omission of such “modifiers” is possible. The Court in *De Lajarte* states that the lack of elements was a key factor in determining that the prior reference did not anticipate the Applicant’s claims. *Id.* As mentioned above, Parker I indicates that it is the presence of specific dialkyl p-benzoquinone modifiers in a precise quantity that makes it possible to create a B-staged polyester/monomer product. Parker II indicates that only the use of 1,4 naphthoquinone as a polymerization modifier provides a suitable B-staged polyester. The use of other quinones, including the “closely related compound 1,2-naphthoquinone” provides unsatisfactory results (column 6, lines 68-74). In contradistinction, the claimed invention provides a stable B-staged molding composition without the use of “modifiers” such as dialkyl p-benzoquinones or 1,4-naphthoquinone. Therefore, the Examiner has not established a *prima facie* case of obviousness of claims 19-26 in light of Parker I in combination with Parker II.

The translation of the abstract of JP 54120675, which provides an epoxy prepeg laminated to an unsaturated polyester layer, also does not teach or suggest a molding compound consisting essentially of at least one unsaturated oligomer resin, at least one unsaturated monomer and optionally, at least one free radical initiator. If the abbreviations used in the translation are fully understood, the polyester comprises 100 parts by weight of an unsaturated polyester resin, 5-50 parts of a crosslinking agent, 0-2 parts of a light polymerization initiator, 1-100 parts of a thermal polymerization initiator, 0.01-1 part of a thermal polymerization inhibitor, 0-500 parts of filler(s) and 0-500 parts of reinforcing materials. The presence of 5-50 parts of a “crosslinking agent” makes the disclosure of JP 54120675 similar to those of Parker I and Parker II. Therefore, a *prima facie* case of obviousness of claims 19 – 26 in light of Parker I and JP 54120675 has also not been established.

The translation of the abstract of JP 401251791 provides a wiring board that is made by using three different resins: an epoxy, a melamine and an unsaturated polyester. Again, if the abbreviations used in the translation of the abstract are fully understood, the composition comprises 10~50 parts by weight epoxy resin having a molecular weight of 5,000 or more, 5~25

parts by weight alkylmelamine resin, 5~50 parts by weight saturated polyester. It should be noted that JP 401251791 calls for the presence of a saturated polyester, not an unsaturated polyester, as recited in the claims. Additionally, the presence of an epoxy resin and an alkylmelamine resin with the saturated polyester, which are dissolved in a mixed solvent and cured, also distinguish JP 401251791 from the present invention. One of skill in the art would not have found a teaching or suggestion of B-staged polyesters from the teaching of a B-staged epoxy/melamine/polyester combination. Therefore, Parker I and JP 401251791 also do not teach or suggest a molding compound consisting essentially of at least one unsaturated oligomer resin, at least one unsaturated monomer and optionally, at least one free radical initiator and the Examiner has not established a *prima facie* case of obviousness of claims 19-26 in light of Parker I in combination with JP 401251791.

For the reasons set forth above, the Applicants maintain that claims 19-26 patentably distinguish over Parker I in view of Parker II or JP54120675 or JP 401251791. Reversal of this rejection under 35 U.S.C. § 103(a) is respectfully requested.

Claims 2-4, 10-14, and 19-30 stand rejected under 35 U.S.C. § 103(a), as obvious over Mitani or Parker I in view of Mathur, Lane or JP54120675. As provided above, neither Mitani nor Parker I nor JP 54120675 teach or suggest the molding composition recited in claims 19-26. Neither do they teach or suggest a method of making a thickened compound, a method of non-reversibly cross-linking a compound, or a method of preparing a compound, where the method includes preparing a mixture consisting essentially of an unsaturated oligomer resin and an unsaturated monomer, either with or without a free radical initiator, as recited in claims 2-4.

In reviewing the scope and contents of Mathur, it is apparent that all of Mathur's examples additionally contain "100 ppm of hydroquinone as a stabilizer" (column 4, lines 45-46). Therefore, Mathur's disclosure is similar to Parker I's disclosure in terms of the content of the composition, i.e., they require the presence of a quinone compound. Additionally, Mathur also does not provide a stable, partially cross-linked compound as recited in the claims. Mathur instead provides heat, UV irradiation and electron beam polymerization methods in connection with complete polymerization and crosslinking.

Lane discusses the use of various techniques for cross-linking, including heat, UV irradiation, and electron beam bombardment. However, Lane provides a metal-polymer complex in which the complex is destroyed and a metal salt in the metal-polymer complex is reduced to elemental metal during or after final cross-linking. (Abstract.) Lane does not teach or suggest the irradiation of a composition consisting essentially of at least one unsaturated oligomer resin and at least one unsaturated monomer.

The methods recited in claims 2-4 and 10-14 are neither taught nor suggested by the cited references. Claim 2 recites a method of making a thickened compound comprising preparing a composition consisting essentially of at least one unsaturated oligomer resin, and at least one unsaturated monomer; and non-reversibly, partially crosslinking the composition a predetermined amount by irradiation to provide a stable, partially crosslinked composition, wherein the viscosity of said composition is increased and further wherein the partially crosslinked composition is capable of being further crosslinked.

As mentioned above, Mitani requires the presence of isocyanates in the molding composition. Mathur and Parker I require the presence of quinones such as dialkyl p-benzoquinones as modifiers to create a polymerized polyester. Additionally, JP 54120675 calls for the presence of 5-50 parts of a “crosslinking agent” and Lane calls for the presence of a metal-polymer complex. Therefore, none of these cited references teach or suggest a method of making a thickened compound comprising preparing a composition consisting essentially of at least one unsaturated oligomer resin, and at least one unsaturated monomer as recited in claim 2. Reversal of the rejection of claim 2, and claims 10-14 which depend from and include all the limitations of claim 2, is respectfully requested.

The method recited by claim 3 also patentably distinguishes over the cited prior art. Claim 3 recites a method of non-reversibly crosslinking a compound comprising: preparing a composition comprising an amount of unsaturated oligomer resin, an amount of unsaturated monomer, and an amount of a free radical initiator; and irradiating the composition with high-energy electrons, wherein a plurality of non-reversible crosslinks are formed, and wherein formation of said crosslinks is dependent upon an absorbed dose and a dose rate of said high-energy electrons and the dose and dose rate are selected to provide a non-reversibly, partially

crosslinked compound. None of the cited references teach or suggest such a method, either independently or in combination. Mitani and Parker I do not teach or suggest the use of irradiation to polymerize a polyester. Lane provides a method that requires the presence of a metal-polymer complex. While Mathur discloses the use of irradiation to cure a polyester, Mathur provides no teaching or suggestion of doing so to create a B-stage polymer. Additionally, given the requirements of Mitani, Parker I and JP 54120675 for an isocyanate, quinone or cross-linking component to successfully obtain a polymer, in considering the references as a whole, one of skill in the art would find no teaching or suggestion to combine the teachings of these cited references to arrive at the claimed invention. One of ordinary skill in the art would also have had no reasonable expectation of success in making such a combination. Therefore, claim 3, and claims 27 and 28 which depend from and include all the limitations of claim 3, patentably distinguish over the cited prior art.

Claim 4 recites a method of preparing a compound which is suitable for use in compression molding operations comprising preparing a thermoset mixture consisting essentially of an unsaturated oligomer resin, an unsaturated monomer, and a free radical initiator, forming a partially crosslinked mixture by selectively irradiating at least a portion of said thermoset mixture to a desired increased viscosity, placing said partially crosslinked mixture into a mold, and heating said mold to a temperature sufficient to convert said partially crosslinked mixture to a cured and a molded product. As mentioned above, Mitani requires the presence of isocyanates in the molding composition. Lane's method requires the presence of a metal-polymer complex. Mathur and Parker I require the presence of quinones such as dialkyl p-benzoquinones as modifiers to create a polymerized polyester. Additionally, JP 54120675 calls for the presence of 5-50 parts of a "crosslinking agent." None of these references, therefore, teach or suggest the use of a thermoset mixture as recited in claim 4.

Furthermore, while Mathur discloses the use of irradiation to cure a polyester, Mathur provides no teaching or suggestion of doing so to create a desired increase in viscosity to provide a partially crosslinked mixture and heating the partially crosslinked mixture to create a fully cured and molded product. Additionally, given the requirements of Mitani, Parker I and JP 54120675 for a specific component to successfully obtain a polymer, one of skill in the art would find no teaching or suggestion to combine the teachings of these references with Mathur to arrive

at the present invention. Therefore, claim 4, and claims 29 and 30 which depend from and include all the limitations of claim 4, patentably distinguish over the cited prior art.

The Examiner also maintains that Mitani et al and Parker I teach partially crosslinked B-stage polyesters, and thus use of well known electron beam sources of secondary references in partial curing of the composition (or further curing thereof) taught by Mitani et al or Parker I would be obvious because one would know how to adjust the dosage of irradiation in order to obtain a partially cured polyester. However, as stated previously, references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination. Mitani et al and Parker I, as a whole, do not suggest such a desirability and thus obviousness to make the combination. The Examiner merely chooses portions from the references in order to draw his conclusion. Neither do Mitani and Parker I teach or suggest the use of irradiation to create a partially cross-linked composition as recited in claims 2-4.

Distinctions between claims 19-26 and Mitani, Parker I and JP 54120675, provided above, are repeated herein with respect to the rejection of these claims under 35 USC § 103(a) as obvious over Mitani or Parker I in view of Mathur, Lane or JP54120675. Additionally, these claims are patentably distinguishable over Mathur and Lane as well. As mentioned above, Mathur, similar to Parker I, requires the presence of a quinone compound. Additionally, Mathur also does not provide a stable, partially cross-linked compound as recited in the claims. Mathur instead provides heat, UV irradiation and electron beam polymerization methods in connection with complete polymerization and crosslinking. Similarly, Lane does not teach or suggest the irradiation of a composition consisting essentially of at least one unsaturated oligomer resin, at least one unsaturated monomer and optionally, at least one free radical initiator. Lane provides a metal-polymer complex in which the complex is destroyed and a metal salt in the metal-polymer complex is reduced to elemental metal during or after final cross-linking. Therefore, none of the cited references teach or suggest a molding compound consisting essentially of at least one unsaturated oligomer resin, at least one unsaturated monomer and optionally, at least one free radical initiator in which the compound is non-reversibly crosslinked by irradiation within a predetermined amount to provide a stable, partially crosslinked compound, and wherein the partially crosslinked compound is capable of being further crosslinked. Accordingly, reversal of

the rejection of claims 2-4, 10-14, and 19-30 under 35 U.S.C. § 103(a) as obvious over Mitani or Parker I in view of Mathur, Lane or JP54120675 is respectfully requested.

The Applicants maintain that the pending claims patentably distinguish over the cited prior art and request reversal of the Examiner's final rejection of claims 2-4, 10-14 and 19-30. The issuance of a Notice of Allowance is respectfully requested.

The outstanding Office Action was mailed on December 6, 2007. The Examiner set a shortened statutory period for reply of 3 months from the mailing date. Therefore, no petition for an extension of time is believed to be required with the filing of this response. Nevertheless, the Applicants hereby make a conditional petition for an extension of time for response in the event that such a petition is required. No fees are believed to be due with this response. However, in the event that a fee for the filing of his response is insufficient, the Commissioner is authorized to charge any fee deficiency or to credit any overpayment to Deposit Account 15-0450.

Respectfully submitted,

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